



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

3817 Luker Road  
Cortland, NY 13045



August 14, 2008

Martin Wargo, Chief  
Environmental Analysis Section  
U.S. Army Corps of Engineers  
Buffalo District  
1776 Niagara Street  
Buffalo, NY 14207-3199

Attn: Patrice McKenna

Dear Mr. Wargo:

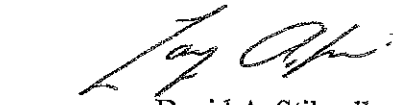
Enclosed for your review are two (2) copies of the Final Fish and Wildlife Coordination Act (FWCA 2[b]) Report for the Chautauqua Creek Dam Removal Project (Section 506 Great Lakes Fishery and Ecosystem Restoration [GLFER] Program), located in Town of Westfield, Chautauqua County, New York.

The purpose of the project is to provide access for steelhead to reach high quality spawning areas within the upper reaches of Chautauqua Creek; provide increased habitat for steelhead and other fish species in the vicinity of the two dams; and, continue to provide a barrier which prevents the migration of sea lamprey to the upper reaches of Chautauqua Creek.

The FWCA 2 [b] Report includes an evaluation of alternatives provided by your staff, additional resource information, and U.S. Fish and Wildlife Service recommendations and concerns. Please provide your comments on this draft report within 30 days.

We appreciate the opportunity to evaluate the proposed project and provide recommendations. Please continue to coordinate with us as the project develops and advise us of any changes so that we may revise our report, if necessary. If you have any questions, please contact Sandra Doran at 607-753-9334.

Sincerely,

  
David A. Stilwell  
Field Supervisor

Enclosures

cc:  
SDoran; Biologist File  
Project, BR & Weekly Files  
ES:NYFO:SDoran:sd:mlp



**Final  
Fish and Wildlife Coordination Act Report  
for the  
Chautauqua Creek Dam Removal Project  
Section 506 Great Lakes Fishery and Ecosystem Restoration  
Chautauqua County, New York**



**Prepared for:  
U.S. Army Corps of Engineers  
Buffalo District  
Buffalo, New York**

**Prepared by:  
Department of the Interior  
U.S. Fish and Wildlife Service  
New York Field Office  
Cortland, New York**

**Preparer: Sandra Doran  
New York Field Office Supervisor: David A. Stilwell  
August 2008**



## EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers, Buffalo District, proposes to restore fish passage to a 10-mile section of Chautauqua Creek, a tributary to Lake Erie. The project, as proposed, will partially remove a small dam and install a rock-ramp fishway at the Westfield Water Works Dams, located in the Village of Westfield, Chautauqua County, New York. Approximately 5 miles upstream from the mouth of the creek at Lake Erie, are a pair of small dams located approximately 300 feet apart. The uppermost dam serves to pool water, which is routed to a nearby municipal water supply reservoir for the Village of Westfield. The lower dam does not serve any present use. Below the site, Chautauqua Creek provides important, though limited, spawning areas for a number of Lake Erie fish species. However, it is the migration of steelhead trout (*Oncorhynchus mykiss*) that is of particular importance from both an ecological and angling perspective. Providing passage at these dams will restore fish access to 10 miles of stream habitat and increase natural reproduction of steelhead.

The preferred alternative proposes to partially remove the lower dam and install a fishway at the upper dam. Due to the relatively low height of the dams, it is feasible to remove only a portion of the dams, while receiving nearly the same benefits associated with full removal. Partial removal of the lower dam would consist of using heavy equipment to remove the uppermost portion of the dam. The remaining portion of the existing dam and bedrock would be passable by steelhead, due to the deep pool located beneath the dam. However, it would continue to act as a barrier to migrating sea lampreys and non-jumping fish species. A rock ramp is proposed to be constructed using traverse ridge rocks to create a series of pools that would extend approximately 100 feet immediately downstream of the upper dam.

The U.S. Fish and Wildlife Service (Service) believes the proposed activity will not adversely impact aquatic habitat in the project area, as it is designed to improve aquatic habitat and restore fish passage. However, without proper design features, the project may negatively affect Chautauqua Creek, downstream of the project area. The project is designed to restore fish passage, improve aquatic habitat and prevent lamprey migration; therefore, the Service believes the proposed activity will not adversely impact aquatic habitat in the project area. However, without proper design features, the project may negatively affect Chautauqua Creek below the project area.

To avoid and/or reduce these impacts, the Service recommends: 1) using best management practices (BMPs) during construction, including work windows; 2) consider installing a 1 inch screen on the trash rack or intake structures to minimize entrainment of fish and macro-invertebrates; 3) conducting pre-construction surveys to assess whether concentrations of contaminants in sediment exceed New York State Department of Environmental Conservation (NYSDEC) guidance values, potentially warranting special removal and/or disposal (NYSDEC 2004); 4) notifying the Service of the construction schedule so that Service biologist(s) can be present during construction; and, 5) conducting post-construction monitoring to identify significant stream channel erosion, assess impacts to macro-invertebrates, and prevent invasive plant colonization and sea lamprey expansion.

To enhance and protect in-stream habitat, the Service also recommends a low flow channel with riffle-pool complexes be restored, and dredge material from future maintenance dredging be disposed of in an appropriate upland disposal site.

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## PROJECT PURPOSE, SCOPE, AND AUTHORITY

The U.S. Army Corps of Engineers, Buffalo District (Corps), is planning to implement measures to restore fish passage in Chautauqua Creek at the Westfield Water Works Dams located in the Village of Westfield, Chautauqua County, New York. The project will restore fish passage to 10 miles of high quality stream habitat to increase natural reproduction of steelhead, contribute to the Lake Erie population, and improve the recreational fishery. The project is being conducted under Section 506 of the Water Resources Development Act (WRDA) of 2000.

This report has been prepared under the authority of, and in accordance with, Section 2[b] of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). Because project plans have not been finalized at this time, the U.S. Fish and Wildlife Service (Service) will continue to work with the Corps as the project develops to avoid and minimize impacts to aquatic resources and identify enhancement opportunities.

## STUDY AREA DESCRIPTION

### *Project Area*

The Westfield Water Works Dams are two small dams located along Chautauqua Creek, in the Village of Westfield, Chautauqua County, New York (Figure 1). The two dams are located approximately 300 feet apart and approximately 5 miles upstream of the Lake Erie confluence. The lowermost dam (40 feet long x 4.5 to 7 feet high) is an abandoned pool and diversion structure, and is the first significant barrier blocking fish passage upstream. With the exception of some steelhead, the lower dam blocks passage of most fish during baseflow conditions. The upper dam (80 feet long x 3 feet high) serves to pool and divert streamflow to the Westfield municipal water supply reservoir. The upper dam blocks passage for most fish, including steelhead. Both dams are located along a steep-gorged section of Chautauqua Creek, are run-of-the-river, and store a minimal amount of water.

### *General Description*

To restore fish passage through the Westfield Water Works Dams, the project will partially remove the lower dam and construct a rock-ramp fishway to the upper dam. The site plan and cross sections have been revised to include a low flow channel. The original proposal included a 2 foot wide notch which was too constrictive for fish passage. This has been increased to 4 foot and 8 foot widths between the stop log rails to ensure alignment with the existing downstream pool and facilitate fish passage. Stop log rails and a horizontal "lip" will be also be incorporated into the lower dam to prevent sea lamprey (*Petromyzon marinus*) migration. The bottom 2 feet of the lower dam will be left in place. The rock-ramp fishway will span the channel width and extend approximately 100 feet downstream from the upper dam. The combined project will restore steelhead access to 10 miles of high quality stream habitat in upper Chautauqua Creek. Fish passage restoration will increase steelhead reproduction and support the Great Lakes Fishery Commission (GLFC) objective to protect and restore self-sustaining steelhead populations in Lake Erie (Ryan et al., 2003).



### ***Threatened and Endangered Species***

One Federally-listed endangered species (Clubshell, *Pleurobema clava*), and one candidate species (Rayed bean, *Villosa fabalis*), are present in Chautauqua County. However, there are no Federally-listed species known to occur in Chautauqua Creek at this time. No habitat in the project impact area is currently designated or proposed "critical habitat" in accordance with provisions of the ESA. Therefore, no Biological Assessment or further Section 7 consultation under the ESA is required with the Service. Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered. The most recent compilation of Federally-listed and proposed endangered and threatened species in New York is available on our website at <http://www.fws.gov/northeast/nyfo/es/section7.htm>.

Until the project is complete, we recommend that you check the website every 90 days to ensure that listed species presence/absence information for the proposed project is current.

The bald eagle (*Haliaeetus leucocephalus*) is no longer protected by the Federal ESA; however, it remains on the New York State list as a State-listed species and is also protected under the Migratory Bird Treaty Act (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755) and the Bald and Golden Eagle Protection Act, (16 U.S.C. 668-668d). The National Bald Eagle Management Guidelines (2007) can be found on our website at <http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf>.

The Service recommends that the Corps contact the New York State Natural Heritage Program for information on the bald eagle and other State-listed species. The contact for the New York State Natural Heritage Program is Ms. Jean Pietrusiak, New York State Natural Heritage Program, 625 Broadway, Albany, NY 12233 (telephone: 518-402-8935). Because data on listed species are frequently updated, we recommend that the project sponsor coordinate with both the Service and the Natural Heritage Program, until the project is complete, for information on listed species.

### ***Wetlands***

There are no State or National Wetlands Inventory (NWI) wetlands mapped within the project area (NYSDEC Freshwater Wetland Map; U.S. Fish and Wildlife Service, NWI Map). A site investigation was conducted by the Service on October 9, 2007, and no wetlands were identified within the project area.

### ***Vegetation***

Below the lower dam (facing downstream), the right bank is comprised of a steep, unvegetated slope. Mature riparian forests within the Chautauqua Gorge dominate the remainder of the project site. Dominant tree species include Eastern hemlock (*Tsuga canadensis*), American beech (*Fagus grandifolia*), oaks (*Quercus spp.*), and maples (*Acer spp.*).

## ***Fish and Wildlife Resources***

Avian wildlife habitat observed during our site visit included mature forested, deciduous communities that support species such as cerulean warbler (*Dendroica cerulea*), wood thrush (*Hylocichla mustelina*), Baltimore oriole (*Icterus galbula*), rose-breasted grosbeak (*Pheucticus ludovicianus*), scarlet tanager (*Piranga olivacea*), bay-breasted warbler (*Dendroica castanea*), black throated blue warbler (*Dendroica caerulescens*), worm-eating warbler (*Helmitheros vermivorum*), black-billed cuckoo (*Coccyzus erythrophthalmus*), brown thrasher (*Toxostoma rufum*), and Canada warbler (*Wilsonia canadensis*). These species are high on the list of priority species to be protected in Bird Conservation Region (BCR) 13 (Hartley, 2007). Game birds that are expected to be found in this area include wild turkey (*Meleagris gallopavo*), ring-necked pheasant (*Phasianus colchicus*), and ruffed grouse (*Bonasa umbellus*) (Robertson and Rosenberg, 2003).

Terrestrial wildlife expected at the site include large and small mammals such as the white-footed mouse (*Peromyscus leucopus*), red squirrel (*Tamiasciurus hudsonicus*), gray squirrel (*Sciurus carolinensis*), mink (*Mustela vison*), weasel (*Mustela sp.*), woodchuck (*Marmota monax*), eastern cottontail (*Sylvilagus floridanus*), skunk (*Mephitis mephitis*), raccoon, (*Procyon lotor*), eastern chipmunk (*Tamias striatus*), porcupine (*Erethizon dorsatum*), white-tailed deer (*Odocoileus virginianus*), red fox (*Vulpes fulva*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), and black bear (*Ursus americanus*) (NYSDEC website: <http://www.dec.ny.gov>).

The fish community in Chautauqua Creek is comprised of smallmouth bass (*Micropterus dolomieu*), northern hog sucker (*Hypentelium nigricans*), river chub (*Nocomis micropogon*), creek chub (*Semotilus atromaculatus*), central stoneroller (*Campostoma anomalum*), longnose dace (*Rhinichthys cataractae*), blacknose dace (*Rhinichthys atratulus*), white sucker (*Catostomus commersoni*), rainbow darter (*Etheostoma caeruleum*), sculpin (*Cottus sp.*), brown trout (*Salmo trutta*), migratory steelhead, and non-migratory rainbow trout (J. Markham, DEC, pers. comm.). These fish species typically inhabit medium gradient, warmwater streams with distinct riffles and pools (Smith, 1985). Presence of young-of-the-year steelhead, below the project site, indicates some natural reproduction in Chautauqua Creek. To supplement natural reproduction, 40,000 yearling steelhead are stocked by NYSDEC at the S. Gale Street Bridge and below the project site. An approximate 1,350 brown trout are stocked by NYSDEC above the project site annually (J. Markham, DEC, pers. comm.).

## **PROJECT IMPACTS**

Impacts to fish and wildlife resources associated with project construction and operation include both short-term impacts and permanent impacts. Short-term impacts are those associated with construction and equipment access. Permanent impacts are those associated with the in-stream structures and habitat changes.

### ***Short-Term Impacts***

Short-term impacts will likely include temporary increases in turbidity and sedimentation in the stream channel, temporary habitat loss, and direct mortality of benthic organisms. Temporary turbidity plumes created during equipment access and construction can reduce dissolved oxygen

and increase channel sediment load, which may reduce primary production and result in fish and benthic invertebrate mortality. Equipment access and in-stream work should be restricted to low flow periods, between June 1 and September 1 to avoid adverse impacts to fish during critical life stages. Furthermore, best management practices (BMP) should be implemented to assure construction-related turbidity and sedimentation does not exceed conditions of regular storm events. Since the Westfield Water Works Dams divert stream flow to a municipal water supply reservoir, contaminant levels should be evaluated to ensure compliance with U.S. Environmental Protection Agency standards prior to dam removal.

### ***Permanent Impacts***

Permanent impacts to fish and wildlife resources associated with the project potentially include long-term habitat changes associated with the alteration of riparian vegetation, and changes in channel morphology associated with partial dam removal and rock-ramp construction. Other potential impacts include downstream scour and bank erosion, head-cutting (if stream slope changes are not properly designed), aggradation of bed material (generally associated with overwidening a stream and thereby reducing stream power), disturbance to riparian vegetation and floodplain areas resulting from equipment access, and colonization of invasive plants (*e.g.*, common reed, *Phragmites australis*; purple loosestrife, *Lythrum salicaria*) in disturbed areas. The Service recommends that the Corps conduct a hydrologic evaluation of the creek and assess potential impacts as a result of the project.

## **FISH AND WILDLIFE CONCERNS AND PLANNING OBJECTIVES**

The project will restore steelhead and other fishes with access to 10 miles of high quality stream habitat in upper Chautauqua Creek. Upper Chautauqua Creek supports naturally reproducing rainbow and brown trout that provide significant recreational fisheries. These fisheries may be affected by increased competition with steelhead (Kocik, 1992). Since rainbow and brown trout are naturalized species introduced to provide recreational fisheries, the Service has no biological concerns regarding competition and possible displacement of these species by steelhead.

Since 1986, the Service has been working in partnership with the GLFC and the Canada Department of Fisheries and Oceans to control sea lamprey throughout the Great Lakes, including Lake Erie and its tributaries. Chautauqua Creek currently supports limited sea lamprey populations; however, fish passage restoration may improve sea lamprey migration into more suitable spawning and reproductive habitats above the project site. Despite limited studies evaluating their effectiveness (Hunn and Youngs, 1980), stream barriers are promoted to restrict sea lamprey migration (Lavis et al., 2003). The Service recommends pre- and post-construction assessments of sea lamprey populations in Chautauqua Creek to document effectiveness of partial dam removal with horizontal lip to restrict sea lamprey migration. Such information would assist future efforts to restore fish passage throughout the Great Lakes basin while preventing expansion of aquatic invasive species.

Final design plans, including sequence of construction and equipment access, were not included in the June 13, 2008, letter regarding the Environmental Assessment and Findings of No Significant Impact (FONSI). Service staff, including fishway engineers, will continue working with the Corps and project sponsors to develop appropriate measures to reduce impacts during construction and identify opportunities to enhance fish and wildlife resources. The Service

would like to be notified of the construction schedule, so that our field Biologist(s) can be present during construction. In addition, we request that the Corps provide the output from the Hydrologic Engineering Center's River Analysis System (HECRAS) data for the water surface elevation versus the discharge rating curves, so that the Service can generate the tailwater curve for the two downstream stations (197.865 or 241.09). We would expect that the tailwater would be up at the beginning of the spring run-off. If that is the case, the Service would recommend that the boards be installed over winter or early spring, if possible.

## **EVALUATION METHODOLOGY**

The Service has reviewed literature and documents pertinent to the project area, the aquatic resources, and the fish and wildlife species that would be affected. We also performed a site visit on October 9, 2007. Information collected during the site visit included identification of aquatic, avian, terrestrial, and riparian communities within the disturbance area, the landscape position of these communities, and potential habitat enhancement opportunities.

## **FISH AND WILDLIFE RESOURCES WITHOUT THE PROJECT**

In the absence of the proposed action, the Westfield Water Works Dams will continue to block fish access to 10 miles of high quality stream habitat in the upper Chautauqua Creek, and not support objectives of the GLFC to increase natural reproduction and self-sustainability of steelhead populations in Lake Erie. Without the project, non-migratory rainbow and brown trout will be protected from steelhead competition in the upper watershed. Furthermore, sea lamprey migration to potential spawning and reproductive habitats upstream will continue to be blocked.

## **FISH AND WILDLIFE CONSERVATION MEASURES AND RECOMMENDATIONS**

Final design plans, including sequence of construction and equipment access, were not included in the Public Scoping Information Packet. The Service will continue to work with the Corps to reduce adverse impacts to fish and wildlife and their habitats, and identify enhancement opportunities as the project continues to develop.

Equipment access and construction will likely result in temporary impacts to stream channels, wetlands, riparian and floodplain areas, and native vegetation. Impacts to these habitats should be reduced to the fullest extent possible and quantified. Following construction, disturbed areas should be restored to their approximate pre-construction conditions. Disturbed areas of highly erodible soils should be immediately seeded with annual rye within the growing season to prevent erosion. Post-construction monitoring should include surveillance to identify and control invasive plants (i.e. common reed and purple loosestrife) from establishing in disturbed areas.

The Service recommended that the Corps conduct a hydrologic evaluation and assess project impacts downstream of the project area to ensure stream flow is not redirected to the stream banks which would promote lateral scour of the steep gorge. The Corps performed a hydrologic analysis to determine the flow frequency curve at the project site. They included detailed tabular and graphical outputs in Attachment 2 of their comment letter of June 13, 2008. The time period of interest for movement of the target fish species is spring and fall, consistent with high water

events in this region. The Corps used the mean annual flood event as the representative design condition. A barrier analysis was not performed.

The location of the notch in the lower dam will be field fit to ensure alignment with the location of the existing downstream pool. The Service would like to be notified of the construction schedule, so that our field Biologist(s) can be present during construction.

As previously stated, the Service requests that the Corps provide the output from the HECRAS data, so that we can generate the tailwater curve for station 197.865 or 241.09. We would expect that the tailwater would be up at the beginning of the spring run-off, if so, we would recommend that the boards be installed over winter or early spring, if possible.

## **GENERAL CONSTRUCTION RECOMMENDATIONS**

### ***General Information/Best Management Practices***

Incorporating BMPs will reduce construction impacts to the project area and downstream reaches. Chautauqua Creek supports diverse fish communities and recreational salmonid fisheries; therefore, the Service recommends in-stream work be restricted to low flow periods between June 1 and September 1 to reduce impacts to spawning fishes, including salmonids. Control measures, including biodegradable netting, soil binders, conservation seedings, and coir or jute mats, should be used to prevent erosion and sedimentation from construction activities.

Measures such as flume or pump-around systems will allow in-stream work to be done "in the dry." When not in use, construction equipment should be stored at least 100 feet from the waterways. Fueling and maintenance should also be performed at least 100 feet from the waterway to reduce opportunities for contamination of the creeks.

Silt fence should be properly installed between disturbed areas and the creeks where practicable. At least 6 inches of the toe of the silt fence should be buried parallel to the ground surface on the upslope side of the fence. The silt fence should be inspected following installation and after significant storm events to ensure proper functioning. Silt fence is preferable to hay or straw bales, as the bales represent a potential undesirable seed source.

If contractors are used for the work, it is generally advantageous to have third-party or Corps inspectors on-site to ensure that proper construction and restoration techniques are used. Although adding to project costs, competent inspectors can greatly increase the chances of successful restoration.

The Service would like to be present on site during construction.

## **SUMMARY AND SERVICE POSITION**

The project is designed to restore fish passage and improve aquatic habitat; therefore, the Service believes the proposed activity will not adversely impact aquatic or terrestrial habitat in the project area. However, without proper design features, the project may negatively affect Chautauqua Creek below the project area. To avoid and/or reduce these impacts, the Service recommends: 1) using best management practices (BMPs) during construction, including work

windows; 2) consider installing a 1 inch screen on the trash rack or intake structures to minimize entrainment of fish and macro-invertebrates; 3) conducting pre-construction surveys to assess whether concentrations of contaminants in sediment exceed New York State Department of Environmental Conservation's (NYSDEC) guidance values, potentially warranting special removal and/or disposal (NYSDEC 2004); 4) notifying the Service of the construction schedule so that Service biologist(s) can be present during construction; and, 5) conducting post-construction monitoring to identify significant stream channel erosion, assess impacts to macro-invertebrates, and prevent invasive plant colonization and sea lamprey expansion.

To enhance and protect in-stream habitat, the Service also recommends a low flow channel with riffle-pool complexes be restored, and dredge material from future maintenance dredging be disposed of in an appropriate upland disposal site.

The Service supports fish passage restoration on Chautauqua Creek and recommends modifying the design to incorporate the above concerns to enhance fish passage, reduce erosion and sedimentation, and protect fish resources in Chautauqua Creek.

## LITERATURE CITED

- Hartley, M. 2007. Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13) Final Draft. Atlantic Coast Joint Venture U.S. Fish & Wildlife Service, 103 East Plumtree Road, Sunderland, MA 01375. 14 p.
- Hunn, J.B., and W.D. Youngs. 1980. Role of Physical Barriers in the Control of Sea Lamprey (*Petromyzon marinus*). Canadian Journal of Fisheries and Aquatic Sciences 37:1895-1905.
- Kocik, J.F. 1992. Evaluation of Juvenile Brown Trout and Steelhead Competition in Great Lakes Tributaries. Michigan Department of Natural Resources, Fisheries Research Report No. 1989.
- Lavis, D.S., A. Hallett, E.M. Koon, and T.C. McAuley. 2003. History of and Advances in Barriers as an Alternative Method to Suppress Sea Lamprey in the Great Lakes. Journal of Great Lakes Research 29 (Supplement 1): 362-372.
- NYSDEC. 2004. In-Water and Riparian Management of Sediment and Dredged Material. Division of Water, Technical and Operational Guidance Series (TOGS) 5.1.9 [http://www.dec.ny.gov/docs/water\\_pdf/togs519.pdf](http://www.dec.ny.gov/docs/water_pdf/togs519.pdf)
- Robertson, B., and K. Rosenberg. 2003. Partners In Flight Landbird Conservation Plan: Physiographic Area 24: Allegheny Plateau. Cornell Lab of Ornithology. [http://www.blm.gov/wildlife/pl\\_24sum.htm](http://www.blm.gov/wildlife/pl_24sum.htm)
- Ryan, P.A., R. Knight, R. MacGregor, G. Towns, R. Hoopes, and W. Culligan. 2003. Fish-Community Goals and Objectives for Lake Erie. Great Lakes Fishery Commission. Special Publication 03-02. 56 p.
- Smith, C.L. 1985. The Inland Fishes of New York State. New York State Department of Environmental Conservation. 522 p.
- USFWS. National Bald Eagle Management Guidelines. 2007. [Internet] <http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf>





## **Appendices**





DEPARTMENT OF THE ARMY  
BUFFALO DISTRICT, CORPS OF ENGINEERS  
1776 NIAGARA STREET  
BUFFALO, NEW YORK 14203199

REPLY TO  
ATTENTION OF:

Environmental Analysis Team

18 JAN 2008

**SUBJECT:** Section 506 GLFER Program Project - Chautauqua Creek Dam Removal, Village of Westfield, Chautauqua County, New York.

Mr. David A. Stilwell, Supervisor  
U.S. Fish and Wildlife Service, New York Field Office  
3817 Luker Road  
Cortland, New York 13045  
ATTN: Ms. Sandra Doran

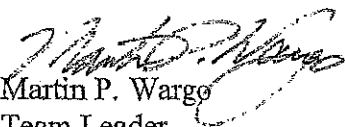
Dear Mr. Stilwell:

The U.S. Army Corps of Engineers-Buffalo District (USACE) is currently studying the feasibility of providing fish passage on Chautauqua Creek in the Village of Westfield, Chautauqua County, New York under the authority of Section 506 of the 2000 Water Resources Development Act, as amended. In e-mail correspondence dated August 13, 2007, the USACE requested that your office prepare a Draft Fish and Wildlife Coordination Act Report (DFWCAR) for the proposed project and provided a Scope of Work (SOW) for this activity. A draft report for the subject project Ohio was received from your office on December 7, 2007.

The DFWCAR has been distributed to the USACE's project delivery team to solicit input and comment. The attached response (Enclosure 1) constitutes the team's comments regarding the USFWS's conservation and construction measures and recommendations contained in the draft report. Please review the comments and provide us with your final version of the Fish and Wildlife Coordination Act Report.

We appreciate your efforts in the preparation of this report to date, and look forward to continuing to work with you as this project progresses. If you have any questions or comments regarding this matter, please contact Mr. Jay Miller of the Environmental Analysis Team, who may be reached at 716-879-4394 (E-mail: james.m.miller@lrb01.usace.army.mil), or by writing to his attention at the above address. Thank you again for your assistance with this project.

Sincerely,



Martin P. Wargo

Team Leader

Environmental Analysis Team

## **ENCLOSURE 1**

### **Section 506 GLFER Program Project - Chautauqua Creek Dam Removal, Village of Westfield, Chautauqua County, New York**

#### **USFWS Draft Fish and Wildlife Coordination Act Report Section 2(b) Conservation and Construction Measures and Recommendations: USACE Response/Comments**

*USFWS Recommendation #1: Use of BMPs during construction, including work windows.*

**USACE Response:** Concur. The USACE mandates BMPs, such as silt fencing, conservation seedings etc., be implemented by their contractors on all construction projects. We additionally concur with the construction window as proposed (work during low flow periods between June 1 and September 1).

*USFWS Recommendation #2: Consider installing a 1-inch screen on the trash rack or intake structure to minimize entrainment of fish and macro-invertebrates.*

**USACE Response:** Concur. A 1-inch screen will be considered for this project. However, it will ultimately be the decision of the local sponsor whether or not to implement the screen, as a screen would require considerable additional maintenance on their part to prevent clogs and otherwise ensure water can easily get into the intake.

*USFWS Recommendation #3: Conduct pre-construction surveys to assess potential for contaminants and water quality.*

**USACE Response:** The USACE has conducted several site visits and completed a 'desktop' survey of the project area and those areas lying upstream of the project. The upper portion of the Chautauqua Creek watershed immediately surrounding the creek is comprised of largely undisturbed forested habitat on both sides of the creek, with little agricultural and no industrial input. Therefore, no potential source of contaminant was identified for the creek and sediment testing was deemed unnecessary. Further, any sediment excavated for the project would be used as a base layer for the proposed rock ramp, and therefore would not be released downstream. Water quality, other than typical minor short-term disturbances due to turbidity, should be unaffected by the proposed project.

*USFWS Recommendation #4: Conduct a hydrological analysis of the creek and assess potential impacts to the stream channel upstream and downstream of the project area.*

**USACE Response:** A hydrologic and hydraulic analysis was performed for design of the rock

**ENCLOSURE 1: USACE Comments/Response, continued**

ramp. Design stream velocities were determined and used to size the stone to ensure the stability of the rock ramp fishway. No explicit assessment of lateral scour potential was made, but qualitative analysis of the nature of the proposed construction reveals that post-project conditions will likely be less favorable for lateral scour than existing conditions for the following reasons. Currently there is a free overfall at the dam, which has caused a scour hole to form downstream. The rock ramp will eliminate the free overfall, dissipating energy more gradually and eliminating the downstream scour hole. Velocities downstream of the dam will be reduced in comparison to the existing condition. Additionally, the rock ramp fishway will have a gradual slope away from the steep gorge wall on the right-descending-bank, forming a low flow channel that will lead to the left side of the dam. This mirrors the crest of the existing dam, which is not being modified. Therefore there is no reason to believe the rock ramp would tend to concentrate flow at the dam site against the gorge wall to an extent greater than occurs at the present time.

*USFWS Recommendation #5: Conduct post-construction monitoring to identify significant stream channel erosion, assess impacts to macro-invertebrates, and prevent invasive plant colonization and sea lamprey expansion.*

**USACE Response:** Concur. The USACE or other designated resource agency would monitor the project post-construction to ensure the measures implemented are functioning properly, and not causing unforeseen problems up or downstream of the project area. Also, discussions with the USFWS Marquette, MI office indicate that their lamprey control group is willing to commit to Operation and Maintenance (O&M) responsibility for the lamprey barrier. They will monitor for the presence of lamprey in the creek, and if lamprey are detected they will install and remove the stop logs on a seasonal basis, or install them permanently if necessary.

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DEPARTMENT OF THE ARMY  
BUFFALO DISTRICT, CORPS OF ENGINEERS  
1776 NIAGARA STREET  
BUFFALO, NEW YORK 14207-3199

REPLY TO  
ATTENTION OF:

Environmental Analysis Team

13 JUN 2008

**SUBJECT:** Section 506 GLFER Program Project - Chautauqua Creek Dam Removal, Village of Westfield, Chautauqua County, New York.

Mr. David A. Stilwell, Supervisor  
U.S. Fish and Wildlife Service, New York Field Office  
3817 Luker Road  
Ortland, New York 13045  
ATTN: Ms. Sandra Doran

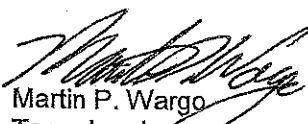
Dear Mr. Stilwell:

The U.S. Army Corps of Engineers-Buffalo District (USACE) is currently studying the feasibility of providing fish passage on Chautauqua Creek in the Village of Westfield, Chautauqua County, New York under the authority of Section 506 of the 2000 Water Resources Development Act, as amended. On March 5, 2008, the USACE distributed a draft Environmental Assessment and Finding of No Significant Impact (EA/FONSI) to the U.S. Fish and Wildlife Service (USFWS), along with other agencies and interests, for review and comment. In a letter dated April 21, 2008, the USFWS offered comments regarding the USACE's draft EA/FONSI for the subject project.

The USFWS's comments have been distributed to the USACE's project delivery team to solicit input and comment. The attached response (Enclosure 1) constitutes the team's responses to the USFWS's comments regarding the EA/FONSI. Please review our responses and provide us with any additional comments you may have. Also note that we are still awaiting a final version of the Fish and Wildlife Coordination Act Report.

We appreciate your efforts in the preparation of this report, and look forward to continuing to work with you as this project progresses. If you have any questions or comments regarding this matter, please contact Mr. Jay Miller of the Environmental Analysis Team, who may be reached at 716-879-4394 (E-mail: [james.miller@usace.army.mil](mailto:james.miller@usace.army.mil)), or by writing to his attention at the above address. Thank you again for your assistance with this project.

Sincerely,

  
Martin P. Wargo  
Team Leader  
Environmental Analysis Team

## ENCLOSURE 1

### Section 506 GLFER Program Project - Chautauqua Creek Dam Removal, Village of Westfield, Chautauqua County, New York

#### USFWS Comments Regarding draft EA/FONSI:

#### USACE Response/Comments

##### USFWS Comment #1: Rock ramp slope, low-flow channel.

**USACE Response:** We concur that the proposed 5% slope of the rock ramp will be adequate for passage of the primary target species – adult steelhead trout. The low-flow channel that is recommended for the ramp is already incorporated into the design. Although it is true that the existing water intake is located on the inside of a bend, there is no field evidence of significant sediment deposition (such as a point bar) in this area, and thus no particular need for sediment control.

##### USFWS Comment #2: Recommend more detailed hydrologic and hydraulic study to re-evaluate notch opening and shape.

**USACE Response:** A hydrologic analysis was performed to determine the flow frequency curve at the project site using the USGS National Flood Frequency computer program implementation of the Regression Equations published for Hydrologic Region 6 of New York State. This analysis was performed in the Watershed Modeling System GIS environment to delineate the watershed and derive input parameters from a 10 meter DEM and the USGS National Hydrography Dataset. The input values and resulting flow frequency curve values are included as Attachment 1 to this comment response letter. The time period of interest for movement of the target fish species is spring and fall, which generally coincides with the timing of high water events in this region. Therefore, the mean annual flood event was deemed to be a representative design condition. The 2-year event, which is a commonly selected surrogate for the mean annual flood event, and the 100-year event, selected as the design threshold for structural stability, were analyzed in a HEC-RAS model that was constructed using survey data collected at the site for this purpose. Detailed tabular and graphical output from that analysis is included as Attachment 2 to this comment response letter.

A barrier analysis similar to the example provided has not been performed, as it is not deemed necessary for project purposes. This is because the barriers to fish passage that are expected post-project are not significant for the target species. Notching the lower dam will lower its height to about 2 feet, a height which is easily jumped by steelhead, and the rock ramp at the upper dam will be constructed with integral pools and at a 5% slope, which as the USFWS notes in their letter is deemed adequate for passage of steelhead trout.



USFWS Comment #3: Relocation of notch to river right.

**USACE Response:** The location of the notch in the lower dam is intended to be field fit to ensure alignment with the location of the existing downstream pool. A note to that effect will be added to the drawings.

USFWS Comment #4: Modification of H-piles to reduce injury risk to migrating fish, trapping of out-migrating juveniles.

**USACE Response:** The corners of the H-piles will be filleted as suggested in order to minimize injury to migrating fish. However, the notch cannot be made trapezoidal due to the need to provide a simple stop-log method of closure should that be necessary for lamprey control. It is noted that the potential for fish to leap into the downstream face of the dam is unavoidable when providing a notch design for fish passage. Complete removal of the dam was considered during plan formulation, but was not carried forward to detailed design because it precluded the ability to provide an effective lamprey barrier.

Regarding the potential trapping of out-migrating juveniles in the rock ramp, this is not expected to be significant for two reasons. First, the fluvial system of Chautauqua Creek has fairly significant amounts of fine and medium sized sediment being transported through it. This material can be expected to become trapped in the voids of the rock ramp, filling them in significantly within a fairly short period of time (probably no more than 1-2 seasons). This process will be jump-started by washing sediment harvested from the bed above the notch in the lower dam over the rock ramp shortly after construction, especially in the vicinity of the low-flow channel. Secondly, out-migration of juveniles predominantly occurs in the fall, which as noted above is typically a time of high flow. During higher flows the depth of water on the ramp will be greater, thus reducing exposure of the fish to any voids in the rock ramp. The potential for some fish to become trapped in the water intake cannot be eliminated since the Village of Westfield has an ongoing need to take water from the stream. However, the Village only operates the intake during summer low-flow conditions when their supply from other sources is reduced. Since this does not coincide with the migration period, overall fish mortality from this is likely to be low.

The steel lip of the lamprey barrier to be mounted on the lower dam is designed to extend 6" beyond the downstream face of the dam, in accordance with guidance received by email from Mr. Gregory Klingler, Fisheries Biologist, USFWS, on 07 October 2007. A design utilizing a lip that extended 18" from the face of the dam would not be likely to survive given that boulder size material is transported through the stream during high flow events.

USFWS Comment #5: Evaluate depths and velocities during fish passage season to ensure effective zone of fish passage.

**USACE Response:** A Manning's equation calculation approximating the low flow channel in the ramp as a triangular channel at 5% slope with 20:1 side slopes and a

hydraulic roughness of 0.035 indicates that the depth of flow would be approximately 0.6 ft (7 inches) during low flow conditions (approximated as 30 cfs as suggested in paragraph 9 of the USF&WS letter). This is an acceptable depth and demonstrates that fish passage will be possible even in this extreme low flow analysis case.

USFWS Comment #6: Measure and develop tailwater and headpond rating curves for both dams.

**USACE Response:** USACE does not believe that such analysis would add value to this project since modifications are being made at both dams to improve fish passage to the extent feasible given project constraints.

USFWS Comment #7: Regression analysis.

**USACE Response:** As noted above, site hydrology has been computed using standard USGS methodologies. The values we report are fairly close to those reported in the letter as from "Regression Analysis," so it is assumed that USFWS performed a similar type of analysis to obtain these values.

USFWS Comment #8: Tailwater curves needed to verify whether the 4-foot notch would be inundated or when to remove stop logs.

**USACE Response:** The project goal for the lamprey barrier feature is to ensure that the notch in the lower dam can be closed using the stop logs in a configuration that provides at least as much protection from lamprey to the upper reaches of Chautauqua Creek as is currently provided by the existing dam. Lamprey are not currently a problem in this stream, but this may possibly be because they are prevented from reaching suitable habitat in the headwaters by the presence of the dams that will be modified by this project. This is quite different from the more typical scenario where a lamprey barrier is designed to be placed in a stream where lamprey are a known problem and arresting their movement is the primary goal of the project. For our purposes it is adequate simply to provide a way of restoring the lower dam crest to its existing height across the entire width by closing the notch with stop logs. We do propose, however, to take the additional measure of installing a lamprey barrier lip across the crest of the dam, which should enhance the effectiveness of the lower dam as a lamprey dam should lamprey become an issue in the future.

USFWS Comment #9: H-piles reduce effective crest width as designed.

**USACE Response:** The width of the notch has been increased as suggested to provide full 4 feet and 8 feet widths between the stop log rails. A calculated stage-flow capacity curve for the weir is included as Attachment 3. This curve demonstrates that even including a conservative approach velocity in the upstream channel, the flow velocity through the notch will be just over 5 ft/sec when flow begins to overtop the dam, at which point the issue becomes somewhat moot since the entire width of the dam will be available for fish passage.

USFWS Comment #10: Concern with depth of flow and velocities through the rock

*ramp at river discharges of 30 cfs or less.*

**USACE Response:** Using the drainage area ratio to transfer flow values from the USGS Cattaraugus Creek at Gowanda gage to the project site is extremely questionable given the fact that they differ by more than an order of magnitude. However, as noted above, we have demonstrated that fish passage through the low flow channel of the rock ramp is possible at the cited flow of 30 cfs. Additionally, the notch hydraulics calculation indicates that the depth of flow at the lower dam will be in the vicinity of 1.3 ft for this flow rate, at a velocity of about 3.6 ft/sec.

**USFWS Comment #11:** *Check for bald eagle nest project site prior to commencement of work, follow Bald Eagle Management Guidelines if found.*

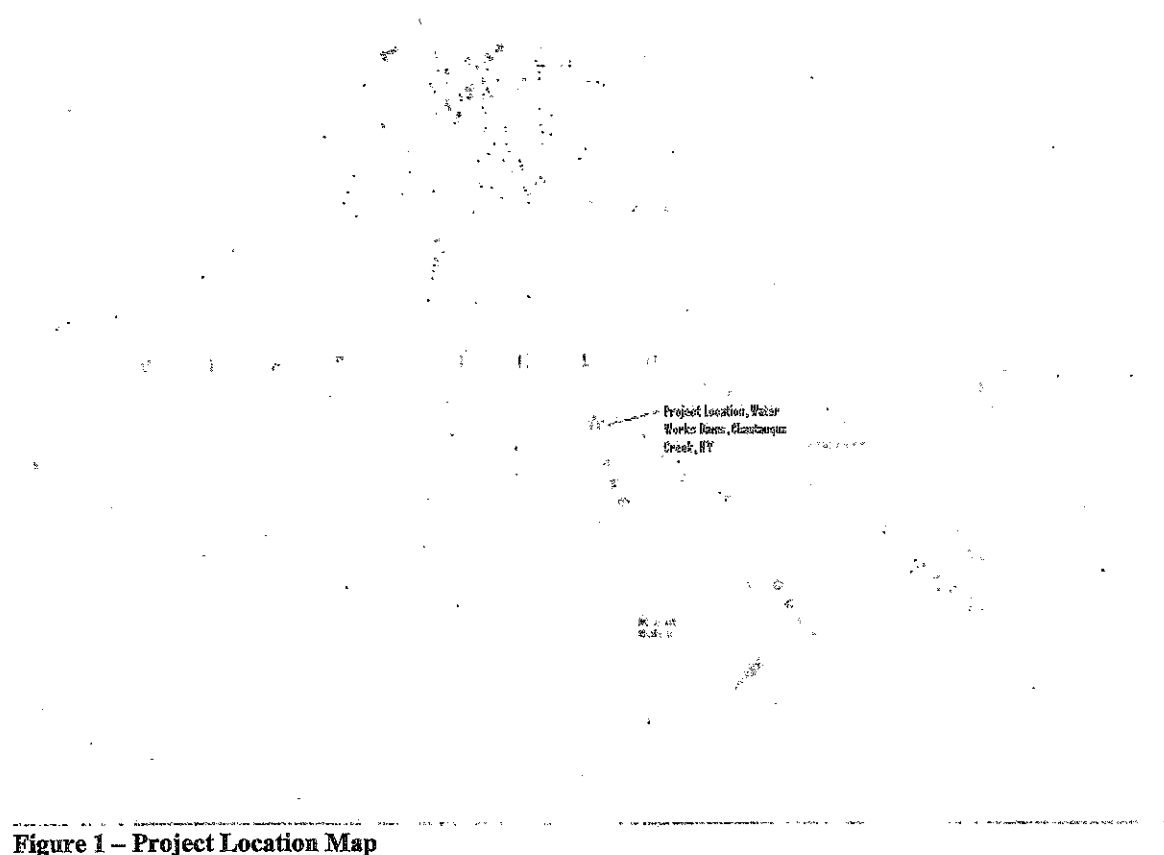
**USACE Response:** Concur. A site walk-over will be conducted through all areas of the project site prior to commencement of construction to determine whether bald eagles are present. If discovered, the Bald Eagle Management Guidelines will be followed.

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## Figures

## Figures



**Figure 1 – Project Location Map**

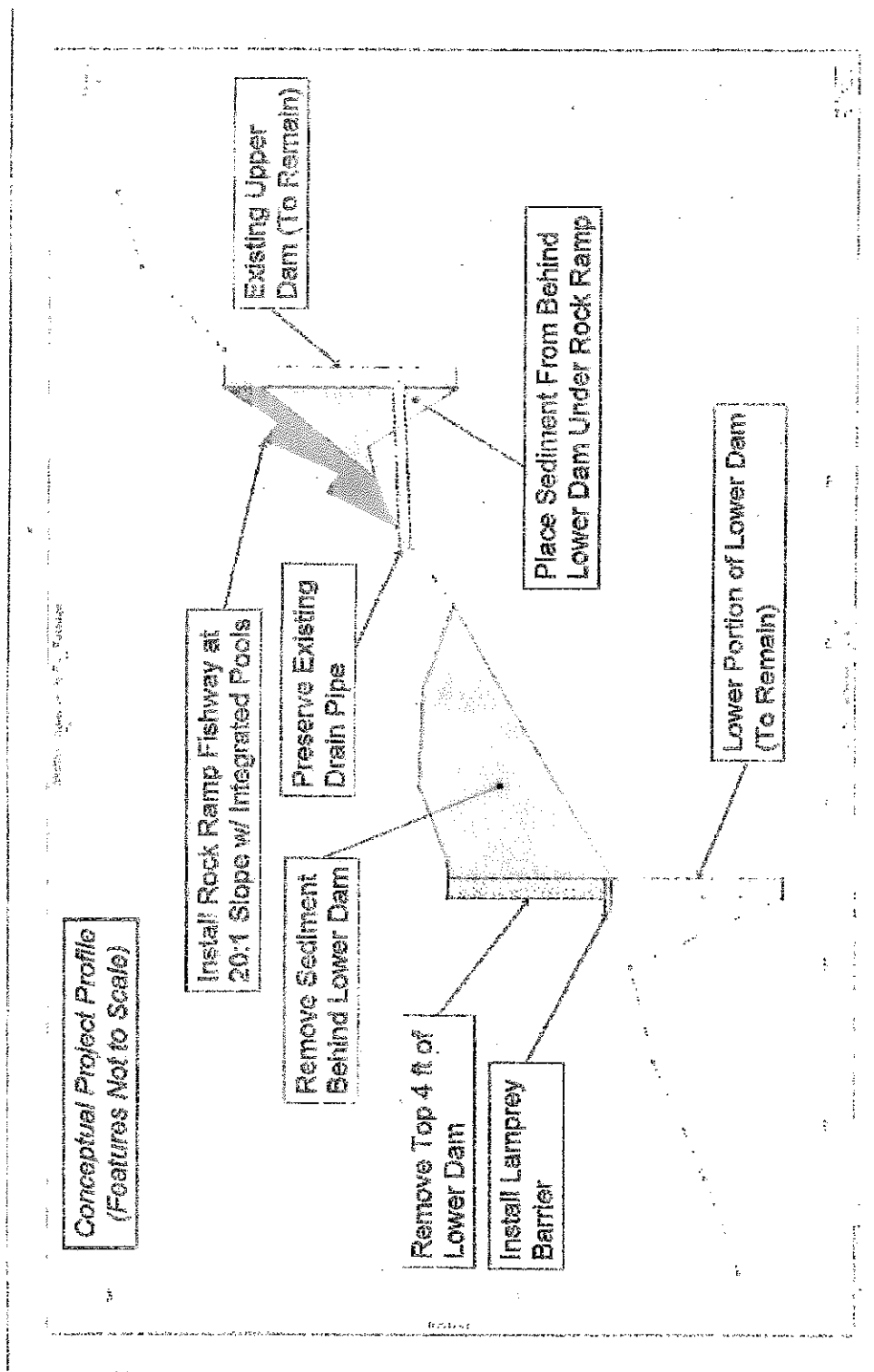


Figure 2 – Chautauqua Creek Preferred Plan

*Service photos taken during Site Visit  
October 9, 2007*

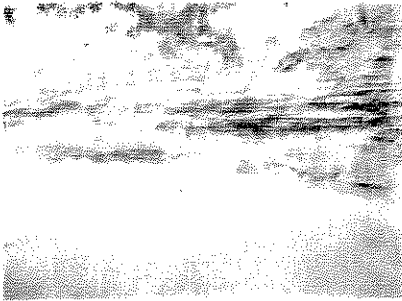


Photo 1: Taken immediately upstream of lower dam.

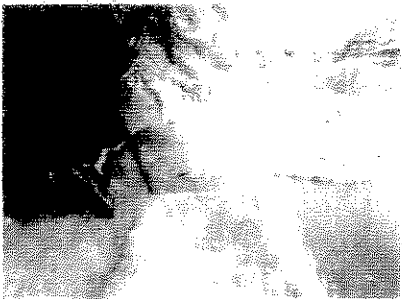


Photo 2: Looking downstream of lower dam, left bank.

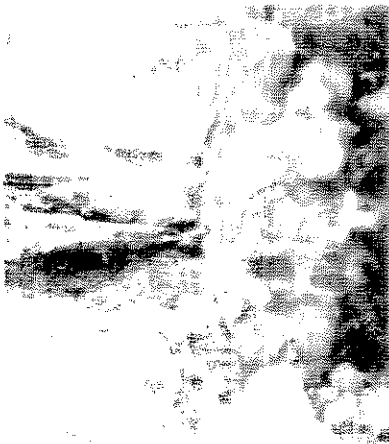


Photo 3: Showing extensive concrete bank stabilization on right bank of lower dam looking upstream.